

# Contents

<b>Preface</b>	<b>xi</b>
<b><u>Condition Monitoring and Fault Diagnosis</u></b>	
On-line condition monitoring of a radial LSHT motor in a pulp washer application <i>(T Huvila, E Mäkinen, Tampere University of Technology, Finland)</i>	15
Fault diagnosis of pneumatic systems <i>(S Fritz, H Murrenhoff, University of Aachen, Germany)</i>	27
Self-organising maps for change detection in hydraulic systems <i>(A Zachrisson, M Sethson, Linköping University, Sweden)</i>	41
Detection of cylinder and valve leakage in hydraulic position servo <i>(E Mäkinen, T Virvalo, Tampere University of Technology, Finland)</i>	53
Pressure based fault detection and diagnosis of a digital valve system <i>(L Siivonen, M Linjama, M Huova, Tampere University of Technology, Finland)</i>	67
<b><u>Pumps: Modelling, Performance and Noise</u></b>	
A simulation study to reduce noise of compact power-split-drive transmissions <i>(R Klop, K Williams, D Dyminski, M Ivantysynova, Purdue University, USA)</i>	83
Flow pulsation reduction for variable displacement motors using cross-angle <i>(L Ericson, J Ölvander, J-O Palmberg, Linköping University, Sweden)</i>	103
High-frequency axial vibration in a combined pump unit with gear stage <i>(M Gasparov, A Kruchkov, L Rodionov, E Shakhmatov, Samara State Aerospace University, Russia)</i>	117
Tribological simulation of a hydrostatic swash plate bearing in an axial piston pump <i>(A Wohlers, H Murrenhoff, University of Aachen, Germany)</i>	129
<b><u>Modelling</u></b>	
Modelling and measurement of the compliance and friction losses of screwjack electromechanical actuators <i>(W Karam, J-C Mare, Laboratoire de Génie Mécanique, France)</i>	145
Numerical analysis of the hydraulic circuit of a commercial common rail diesel fuel injection system <i>(P Beierer, K Huhtala, M Vilenius, Tampere University of Technology, Finland)</i>	159

Experimental study on the use of a dynamic neural network for modelling a variable load sensing pump <i>(L Li, D Bitner, R Burton, G Schoenau, University of Saskatchewan, Saskatoon, Canada)</i>	175
Modelling, simulation and identification of the electro-hydraulic speed governors for Kaplan turbines by AMESim <i>(N Vasiliu, C Calinoui, D Vasiliu, University Politehnica of Bucharest, Romania)</i>	189
The full vehicle simulation – a virtual test environment for mobile hydraulic systems <i>(A Schumacher, H-H Harms, Technical University of Braunschweig, Germany)</i>	201
A Fourier-Galerkin-Newton method for period nonlinear transmission line problems <i>(H Kogler, Linz Centre of Mechatronics GmbH, Austria, B Manhartgruber, R Haas, Johannes Kepler University, Austria)</i>	217
<b><u>Applications</u></b>	
Optimized pace drive concept for glass panel conveyors <i>(D Prust, H Murrenhoff, University of Aachen, Germany)</i>	231
Electric hydrostatic drive – a concept for the clamping unit of a high-speed injection moulding machine <i>(S Räcklebe, S Helduser, Technical University of Dresden, Germany)</i>	245
Energy storing and recovering in loading and unloading cycles of forward loader <i>(T Virvalo, Tampere University of Technology, Finland, W Sun, Zhejiang University, China)</i>	255
An electropneumatic control and actuation system for the vanes of the variable geometry turbine of a turbocharged diesel engine <i>(A Almondo, GM Powertrain Europe, Italy, G Jacazio, Politecnico di Torino, Italy)</i>	269
<b><u>Systems and Control</u></b>	
Metering poppet valve system control <i>(C Harvey, O Cline, R Fales, University of Missouri-Columbia, USA)</i>	283
On stability and dynamic characteristics of hydraulic drives with distributed valves <i>(M Linjama, M Vilenius, Tampere University of Technology, Finland)</i>	297
Pressure tracking control for a self-energizing hydraulic brake <i>(M Liermann, C Stammen, H Murrenhoff, University of Aachen, Germany)</i>	315
Independent force control of pneumatic McKibben actuators using the multiplexing technique <i>(V Jouppila, A Ellman, Tampere University of Technology, Finland)</i>	331

**Fluid Dynamics and Noise**

- Vibroacoustic load reduction in hydro mechanical systems by use of flow oscillation dampers 351  
*(E Shakhmatov, A Kruchkov, A Prokofiev, V Sverbilov, Samara State Aerospace University, Russia)*
- A new method for power steering hose assembly design and acoustic optimisation by means of time domain hydraulic line simulation models 367  
*(H Baum, FLUIDON GmbH, Germany, M Hofmann, Continental Contitech Fluid Technology, France)*
- Numerical simulation of pulsating flow in resonator hose based on measured data of wave speed 383  
*(I-Y Lee, M-G Kang, J-W Kim, Pukyong National University, Korea)*

**High Performance Valves**

- Dynamical performance of a fast magnetorheological (MR) valve 399  
*(J Kostamo, E Kostamo, J Kajaste, M Pietola, Helsinki University of Technology, Finland)*
- Design optimization of a special relief valve with response surface methodology 413  
*(P Casoli, A Vacca, University of Parma, Italy)*
- A proposal to compare electro-pneumatic continuous control valves: required main characteristics 431  
*(S Sesmet R de Giorgi, E Bideaux D Thomasset, Ampere, France, D Hubert ASCO-Joucomatic, France, J Lecerf, CETIM, France)*
- Flow characteristics measurement of large valves 449  
*(B Manhartgruber, Johannes Kepler University, Austria, B Winkler, Linz Centre of Mechatronics GmbH, Austria)*

- Authors' Index** 459